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Indian Stone-curlew (*Burhinus indicus*)

Dr Dushyant Singh Gaur



Barred Jungle Owlet (*Glaucidium radiatum*)

Dr Dushyant Singh Gaur



Kalpveer Singh

Green Bee-eater (*Merops orientalis*)

Kalpveer Singh



Indian Golden Oriole (*Oriolus kundoo*) male

Kalpveer Singh



Scaly-breasted Munia

Zaheer Bakshi



White-throated Laughing Thrush

Zaheer Bakshi

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Barred Jungle Owlet
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Dr Dushyant Singh Gaur
Dr Dushyant Singh Gaur

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White-throated Laughing Thrush
Scaly-breasted Munia

Zaheer Bakshi
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Golden Oriole
Green Bee-eater

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Recently, one such case has come to the knowledge of Editorial Board of Cheetal, where same article was published simultaneously in Cheetal Vol.53 No.3 (2016) as well as in Vigyan Paricharcha 2017 No.2. This Double Publication is regretted and the Author was advised not to repeat the same in future. All future Contributors to “Cheetal” are also advised not to indulge in Self Plagiarism of any kind.

EDITORIAL

"A picture is worth a thousand words" is an English language idiom. It refers to the notion that a complex idea can be conveyed with just a single still image or that an image of a subject conveys its meaning or essence more effectively than a description does. In his later decades of life, our very own Nobel Laureate, Sri Rabindra Nath Tagore took to painting, after he realized that the wealth of literature that he was to leave for the future generations could only be savoured by those who were literates. He realized that a painting could transcend the barriers created between people in the form of literacy, or lack of it.

Owning a camera and bearing the cost of photo-processing restricted majority population of the third world, to indulge in this elitist and expensive hobby. The other people who indulged in it were the professional photographers who could recover the cost by selling their clicked pictures to newspaper and other media. The revolutionary advances in digitization of photography opened a new vista of unlimited possibilities in the field of imaging. Today, with smart cell phone manufacturers boasting of high-definition camera apps, we are blessed to have a camera in our pockets at all times.

Much as the older generation may frown up on the deterioration of literary skills of youngsters, this change is here to stay at least for the present, where science and technology has been dazzling the world by its excellence in the fields of mass media and communication. Dwindling habit of writing, has been progressively replacing the literary flair in people, by their ability to click pictures. This change has been phenomenal amongst the selfie-obsessed Indian youth. In fact, this constant habit of clicking everything by a camera, right from our own faces to the food we are eating, people we are meeting and the moments of life we are celebrating, and then sharing it with the world, has made the global community come closer..... For better or for worse!

Close to home, "Cheetal" as a journal is also facing the crunch of not procuring enough well-written articles for publication. Moreover, there is a constant 'heat' on our Executive Committee and Editorial Board, to bring out 'all color' Cheetal in future; because probably, much like everyone else today, WPS members too feel more confident and comfortable in clicking images than wielding their pen to express their ideas! Smart thing will be to accept the immense power of Digital Technology and use it to save the flora and fauna along with the natural wealth of the only home we have at the moment – our Planet Earth.

As responsible citizens and conservationists, let us move beyond clicking pretty images and indulge in the art of photography with the intention of deploying it as a tool for protection of Nature and its flora and fauna, through Conservation Photography.

The current issue again has some interesting articles to offer; we hope WPS members will enjoy reading them. We eagerly await your feedback as it gives us the impetus to constantly improve the quality of our cherished journal.

Wishing everyone happiness and cheer of the festive season!

Dr. Dushyant Gaur
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The Return of Project Elephant

Vinod Rishi

Elephant in India has been historically linked with the lives of the country's human population. In the fourth century B.C. the elephant's distribution covered eight major forest ranges (Van), according to Kautilya. Since then precise information has been available from the writings and memoirs of Moghul emperors and writers. Elephants were found in the forests of the areas that are now in Gujarat, Madhya Pradesh, Andhra Pradesh, Rajasthan, Himachal Pradesh, besides Uttar Pradesh, Uttarakhand, eastern and north-eastern India. But in 1990s their distribution showed their absence in Himachal Pradesh, Rajasthan, Andhra Pradesh, Madhya Pradesh, Gujarat, and southern West Bengal. The elephant population had been reduced to four disjointed geographical regions: the Shivalaks and terai the north west; south Indian states of Tamilnadu, Kerala, Karnataka, with a recently moved in small population in Andhra Pradesh; eastern Indian state of Odisha, parts of southern West Bengal, and Bihar; and north-eastern forests of northern West Bengal, Assam, Arunachal, Meghalaya, Tripura, Mizoram and some transients from Myanmar into Manipur.

It is said that the stable of Emperor Akbar maintained 40000 elephants during his reign. Other Indian kings and local chieftains also kept a substantial number of elephants in their respective royal stables. Besides, the elephants in captivity there were wild elephants in the forests. No one knows how many elephants were there in India during the beginning of the seventeenth century. But in 1989, the Center for Ecological Studies, Bangalore, estimated there were around 20,000 elephants in India, captive and in the wild. The Government of India set up a Task Force in 1990 to work out the real situation about the Asian Elephant (*Elephas maximus*) in India and what should be done to save them from bleak future the situation called for. The Task Force estimated about 25,000 elephants in the wild and in captivity in India and submitted their suggestions to the Government, accepting that the situation was really alarming because of the fragmentation, degradation and diversion of elephant habitats and the rising intolerance of the people towards the elephant. The attitude of the people was slowly transforming from one of respect and awe for the elephant into an unwanted pest who destroyed their crops and property and even attacked and killed people living in and around the forests. It gave birth to the Centrally Sponsored Project Elephant in February 1992. The Project, code named 'Gajatme' (after Ashoka's edict at Kalsi near Dehradun on the east face of which there is an elephant carved into the stone between whose legs the word "Gajatme" is chiseled in. Gajatme refers to the white elephant that appeared in the dream of Lord Buddha's mother at

the birth of her son) was launched without much fanfare, for it did not have catalyst sponsors like the WWF who had triggered the launch of Project Tiger in 1973 for saving the tiger.

Elephant problem, as it was then called, surfaced in 1976 in northern West Bengal where I was posted as a Divisional Forest Officer. I had been involved in dealing with the problem on both banks of the Teesta River. It was well known that elephants have had a very long history of seasonally visiting cultivated fields to eat the nutrition rich seasonal crops just before they got ready for harvest. They relished the farm produce when the grains in the crop were full of milky juice. In 1976 I noticed the elephants had started visiting Army areas and attacked the ration stores. They soon discovered the pleasure of getting inebriated on hard liquor. Soon they started visiting even the weekly rural markets, sometimes traveling long miles out of the forest, and returned to the forest absolutely glad with the results of their outing into human habitation. My own observations indicated that the trouble had taken a serious turn a few years after a number of large tracts of elephant habitat (as large as 40 sq km or so) had been punched out of their compact forest habitat for meeting the country's defense needs. Elephants still traveled through such areas wherever their seasonal movement routes existed. Sections of their routes passing through river beds were brought under cultivation by villagers who encroached upon them without any legitimate right. Thus many of the traditional elephant movement paths were also fragmented. The incidents of violent face-offs between people and wild elephants shot up.

The Project Elephant included the conflict management as one of their major concerns in their document published in 1993; there were other action points too which dealt with elephants in captivity, skill upgradation of the officers and staff who dealt with elephants under their control, financial support to the elephant range states for meeting the challenges, payment of ex-gratia relief to aggrieved persons who had suffered from elephant visitations, spreading of public awareness and research work.

Almost 20 years after the first Task Force was set up another Task Force was set up in 2010 by the Government of India to review the progress and suggest the way forward. "Gajah" is the name given to the new report. It followed the previous "Gajatme" report and suggested ways and means to move forward from where we had reached in those 20 years of Project Elephant. Strengthening of infrastructure and financial support for elephant conservation had been emphasized in the report. It practically did not offer any improvement on the strategy for elephant conservation in the field.

It was evident from the report that more corridors and elephant reserves were needed to be protected. This was an approach followed by Project Tiger. Like National Tiger Conservation Authority the Task Force recommended constitution of a National Elephant Conservation Authority with autonomous status.

There are many flaws in the report. Fundamentally the elephant conservation cannot survive the closed area approach of Tiger Reserve, because the elephant herds cannot be confined within the bounds of demarcated forests – the elephant is a social and long ranging animal and does not maintain a territory as the solitary and territorial tiger does. Tiger can be managed on ecosystem approach for wildlife management but the elephants need landscape approach for its conservation since the herds move across forests and non forest areas to live their natural life. Without counting out other points it would suffice to say that over the years the behaviour of elephants and people have undergone great change and the human-wild elephant conflict had been affected severely by such changes. To illustrate I present the case of the area and state where I worked and dealt with the problem:

On a moonlit night in December 1975, a herd of fourteen wild elephants trampled through a small paddy field on the far side of the forest rest house at Kathambari in north Bengal in India. The forest staff from the Range headquarters, a couple of hundred meters away, drove the marauders out into the sal forest west of the paddy fields. While inspecting the damage to the crop on the following day the Divisional Forest Officer, Baikunthpur Division, who had witnessed the conflict situation on that night, offered an affected cultivator to shoot the elephants had he approached him. He was admonished by the cultivator for such talk, and reasoned that just as the government levied taxes on him, so did Nature who gave them everything. If it were not the elephants, they lose some crop to other agencies like floods, draught and other natural calamities. Of course, he would be happier if he had been spared that year, for he did not have enough to feed his children.

In north Bengal people would not address the elephant by its common name in reverence for the elephant. In 1975 the presence of elephants was acceptable to the farmer as a part of his environment. He had no grudge against forest department. The Range Forest Officer was his savior, for he was the one who helped him with a few wooden posts and thatch to repair his hut, and it was he who would provide him with some work to tide over the crisis caused by the visit of the elephants.

SOCIO-POLITICAL IMPACT OF PAYMENT OF COMPENSATION:

The system of payment of compensation in cash destroyed the social fabric that had existed between the forester and the people. Most of the rural poor are illiterate and need help to go through any kind of official procedures to make a claim for compensation. As the system works today, as soon as there is any loss caused by elephants or a tiger the affected family is taken to the local forest office by a local school teacher or any other person who knows that the government is bound to pay the compensation at a fixed known rate. But this step of taking the bereaved family to the government office, in a subtle manner, results in further alienation of the local people from the government machinery and establishes the leadership and respect for the local person. If the person has political ambitions he does not lose the chance to exhibit his superiority and indispensability as he approaches the local officer. Compensation is now demanded as a matter of right of the affected family and not as a gesture of good-will on the part of the government. His first step invariably is to create a scene at the local forest office in front of the local people and make a show of a great amount of agitation and effort to have the compensation amount released to the family. The next step is to lead the head of the bereaved family through official formalities and get the papers signed for release of compensation. As soon as the cash is in hand, the scene of activity shifts away from the forest office. The 'sympathetic' good samaritan may take his cut, or labor charges, or overhead expenses for helping the family receive the compensation. Next come the money lenders waiting to recover whatever is possible, and the close friends who would like to celebrate the event of receipt of compensation. The lack of awareness on the part of the poor villager often results in utter dissatisfaction with the system, because the leftover amount is not enough to help him in any manner. In the tribal areas, the affected person returns home in an inebriated condition and cursing everybody under the sun for his woes. The family still remains under the stress of adversity. The local inhabitants are motivated to treat their sufferings as a result of forest department's 'anti-people' policy.

It is a historical fact that forest department had been implementing the government directives on protecting the forest and wild animals for generations in the past and it will be a denial of this fact if one projects that conservation of wildlife is a new issue responsible for people's antagonism towards forest department. The sentiment has emerged only after the system of payment of relief was introduced. The use of wrong terminology – 'compensation' instead of 'relief' – contributed to the unforeseen turn of events. These terms have legal connotations in India. The local sentiments go: 'Because forest department protects the wild animals and pays compensation, and because the payment of compensation is admission of guilt, it is the fault of the forest department that the animals are causing damage to the interest of the people. Besides, compensation means

value equivalence, but the amount being paid by the forest department is not commensurate with the value of the losses suffered by the affected family. Isn't it evident that the forest department follows a pro-wildlife and anti-people policy?'

The example above applied to the other species of wildlife, such as the snow leopard, tiger, bear, wolf, deer, and other wild animals too. The government goes on revising the amount of compensation to be given to people suffering from the effects of man-wildlife conflict. But no amount of money can compensate for the value of life lost, or permanent disability of a person. There is no limit to the amount of compensation that can satisfy human beings for damage caused to a cultivator's crops and property. Also, there is no dearth of people aspiring for a future as political leaders or builders of their economic empires. And there is no place other than the natural habitats where wildlife can live.

Ten years later, in December 1985, a large herd of about 64 elephants lost direction while crossing Teesta river bed westwards from Kathambari and entered into the forests of Batasivita on the far side of the river, where it caused widespread havoc to standing paddy crop till the forest officers undertook a massive operation for driving the disoriented herd over more than seventeen kilometers into Mahananda Wildlife Sanctuary to prevent further depredations. People refused to tolerate the presence of elephants in their neighborhood. The change in the people's sentiments towards the elephant was very conspicuous. People said the elephants belonged to the forest department, so it was the forest department's business to see that the elephants did not stray out of the forest. One had the tendency to think that it was because of the losses to the crop that the people were reacting, but a closer interaction with the people revealed a different story.

Ten years further down the time-lane, during the winter of 1995 the national newspapers were filled with the reports of the march of elephant herds towards Calcutta through agriculture fields in south Bengal. Local newspapers and the electronic media covered the plight of the unfortunate pachyderms as they moved through barren croplands and local towns, pestered by and seeking shelter and security from large and unmanageable pursuing crowds of people, and headed the wrong way. Both the forest officers as well as the disoriented elephant herd suffered at the hands of the local people of Midnapur district.

Again, in Raskundu beat of Gorbeta Range in Midnapur, the district that provided the international award winning Arabari model of Joint Forest Management to the world, people overnight felled 40-50 hectares of forest regenerated by them under JFM because it offered shelter to the elephants. Joint Forest Management did not accept elephants as a part of nature.

In just two decades the elephant in north Bengal degenerated in status from being accepted as an integral natural part of rural agro-sylvan environment to being persecuted as unwanted pests let loose on the people by the forest department. And it applies to other wild animals too that people have started treating as their enemies.

All this change had taken place in just a short period of time – 1974 to 1994. Project Elephant had therefore recommended dealing with the conflicts through public awareness campaigns in the Gajatme document. It is still there as one of the thrust areas, but we have stagnated while the nature of conflict and the key issues to deal with it have taken on new dimensions. The strategies followed up so far and those further recommended for future action did not match the nature and pace of the change. While in 1970s we could consider crop raiding and occasional man-killing by elephants as the big conflict between people and elephants, in 1980s the reluctance of the people to accommodate elephant in the neighboring forest; and in 1990s the conflict had taken the form of serious intolerance of government's elephants in their own habitats. Today, twenty five years after the launching of Project Elephant the conflict scene is unthinkably changed. To see it as a local man vs wild elephant conflict of interest is oversimplification of the conflict.

All over India the conflict between wild animals and human beings is arising at different rates in different parts of the country. What we had seen in northern Bengal in 1970s and 1980s came years later in southern West Bengal, and still later in Andhra Pradesh, Madhya Pradesh, Bihar, and now in Uttarakhand. It is not simply a matter of increase in the population of elephants – because there has been an estimated increase of 2,000 elephants between the years 1990 (25,000) and 2017 (27,000). Far away from the elephant people at policy levels have been unwittingly taking decisions that escalate the conflict. Already shrunk forest patches are further split down by constructing new rail, road and canals; linking of rivers will be the next in line of adding problems for the local people. The true nature of the conflict has grown into the conflict of interest of different government departments with mandates as varied as infrastructure development, economy and conservation ecology. Decisions at the government level are taken in all earnestness to help the people of the country. But what is lacking is the knowledge of the true scope of the word 'Development'. Development need not involve destruction of our life-support systems. Most of the people assert a little bit of destruction of natural resources can be acceptable if the gains by development of infrastructure can be expected to offset the losses caused by destructive development. Good or bad, whatever happens to people will happen later, and why should I, the developer, worry now? Conservation of wildlife and environment? Well, it is the fad of the elite and some others who do not have

anything else to do and who do not matter. This is basically the attitude that rules the ground level life forms, and it has emerged from lack of understanding of natural ecosystems of which the elephant and other wild animals and the local people are an integral part. Our Task Force documents have not understood the basic problem in elephant conservation even now!

Our current keystone strategy for conservation of our natural heritage, including wild animals, landscapes, forests, and life of people is to change the attitudes of the people at administrative and policy levels towards what nature has given us. At the same time review how ex-gratia relief can be provided to the suffering households at the ground level. There are other ways of helping such people effectively, for instance a part of the relief could be the arrangements to get the injured people taken and treated for medical care on priority basis from out of the fund for ex-gratia relief; and the bills paid promptly by the forest government on the lines of the Central Government Health Scheme (CGHS). If handled without the aggrieved person having to run around for his treatment and payment of his medical expenditure the forest department may break the current feeling of antagonism the local people carry at present. There may be other models too which may be explored with change in attitude being the main objective of the exercise.

Development and conservation can go hand in hand is ecology is taught along with economy and engineering in our educational systems, Development Projects are discussed by the departments responsible for them with the government department mandated for keeping our environments and wild animals and forests in good health, the problem of elephant and wildlife conservation on the ground is not perceived as the baby of the forest department, and research body starts finding out the solutions for the violent and deadly relationship growing between wild animals and people. In the end it is the return of public sentiment to empathy for the wild animals and spaces that will act as the keystone strategy to insure that we live in harmony with the elephant and all other things wild as we once were doing in the past.

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About the Author :

Shri Vinod Rishi IFS retired from the Indian Forest Services in 2006. He graduated from IIT-Delhi. He served West Bengal Cadre in the Sunderbans, Darjeeling, Jaldapar, Singalila, Buxa & Neora Valley and in top Central Government Posts including as the first Director of Project Elephant (from 1993 to 1998), As Director, I.G. National Forest Academy, Dehradun and finally as Addl. Director General (Wild Life)



Elephants of Rajaji National Park

by Dr. Dushyant Singh Gaur



Elephants of Corbett National Park

by Dr. Dushyant Singh Gaur



Chukar

Dr. Gobind Sagar Bhardwaj



European Goldfinch

Dr. Gobind Sagar Bhardwaj

Summer Birds of Trans-Himalayan Region of Spiti in Himachal Pradesh, India: A Survey Report

Dr Gobind Sagar Bhardwaj

ABSTRACT

A ten day rapid survey of summer birds in Spiti valley starting from RecongPeo of Kinnaur to KumjumPass of Spiti valley including Kibber Wildlife Sanctuary of Himachal Pradesh revealed the presence of 79 bird species belonging to 22 families. During the survey the Fringillidae family having 13 bird species was observed as most abundant followed by Muscicapidae though the latter was having high species richness having 23 bird species. The survey further revealed geographical extension of some of bird species like Rufous-vented Tit *Parusrubidiventris* and Streaked Laughing Thrush *Garrulaxlineatus* upto Spiti valley which can be attributed to the change in the life style of local people including a shift from traditional agricultural to horticultural practices in developing apple orchards and other fruit species coupled with plantation activities by state forest department and other agencies.

KEY WORDS : Trans-Himalayan region, cold desert, avifauna, Spiti.

INTRODUCTION

Since 19th century onwards considerable research on birds has been done. Most of the early literature on birds was in the form of notes and diaries of British civil servants, army officers based on their travels and expeditions. The pioneer work on Indian birds was done by T.C. Jerdon who published field notes on behaviour and ecology of birds of Indian subcontinent and is considered to be the founder of Indian ornithology (Jerdon, 1864). There are many plants and animals which are considered as biological indicators for a particular ecosystem. However, birds are the best indicators of environmental quality of any ecosystem (Ali & Ripley, 1978). Bird watching is enjoyed by a wide range of people and is considered as a sport by some and a form of nature study by others (Tilghman, 1987). Birds have been popular with ecologists because birds are largely diurnal and often conspicuous and their behaviour can be studied and documented with relative ease, and their distribution, natural history and systematics are generally well known (Wiens, 1989). Nowadays attention is being given to the monitoring and study of ecological patterns of avian fauna in various protected areas across the world to assess the basic health of particular forest ecosystem. In fact, the enquiry into the habitat selection by avian fauna is one of the foremost steps to understand the complexity of their community. Birds are extremely mobile and wide-ranging, and of the range of habitats they pass through or over, only specific ones are used for breeding or foraging or wintering (Cody, 1985). Biologists have already worked a lot on the factors that affect habitat selection in birds for centuries, especially those that segregate taxonomically and ecologically related species (White, 1906; Hilden, 1965; Lack, 1971; Cody, 1974; Terborgh et al., 1990; Lee & Rotenberry, 2005). Vegetation structure is one of the three major factors influencing habitat selection by avian fauna in temperate regions (Cody, 1981). Whereas in tropical areas like India, vegetation composition is another factor which determines habitat selection by birds (Terborgh, 1985).

Though considerable studies have been conducted in Ladakh, very few studies on bird life have been done so far in the area especially in Lahaul and Spiti areas of Himachal Pradesh. A total of over 300 species of birds have been reported from the Ladakh region (Pfister, 2001).

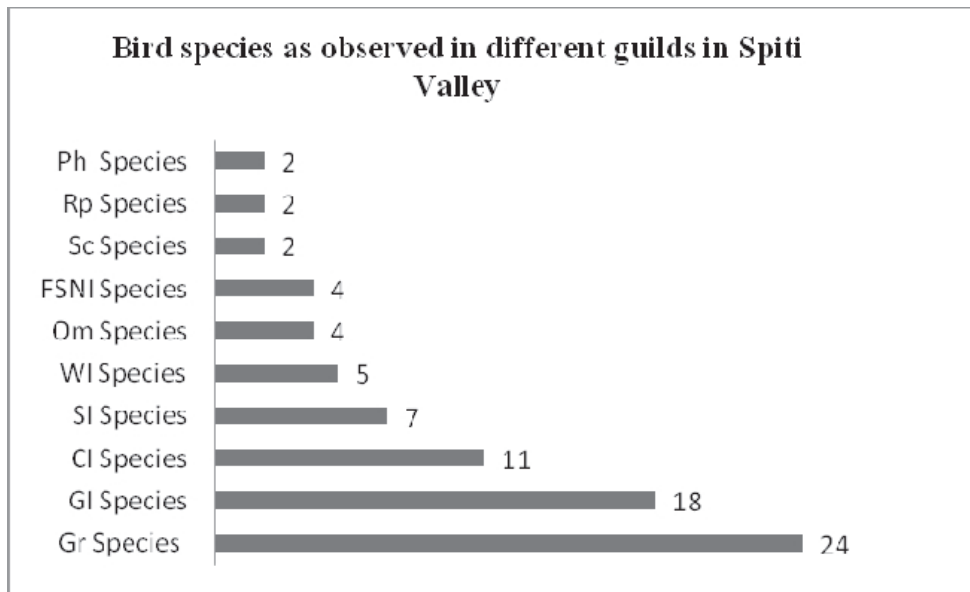
However local altitudinal movements, breeding status, and distributional limits of most avian species are little known as very few studies have been taken up in the past. The old publications are by Adams (1859), Osmaston (1925), Ludlow (1920), Wathen (1923), Delacour, J. (1927), Lapersonne (1928) and Bates & Lowther (1952) apart from A.E. Ward's series of birds and mammals of Jammu and Kashmir in JBNHS (1906). More recently, Holmes (1986), Mallon (1987 & 2002), Pfister (1997) and Mishra Charudutt and Humbert-DrozBlaise 1998 conducted general bird surveys. Kala and Jayapal (1999) reported 225 bird species from 34 families. The ecology of Black-necked Crane was extensively studied in the late '80s and '90s by Narayan et al (1987), Gole (1992), Pfister (1998) and Chandan, P., Gautam, P. & Chatterjee, A. 2006. A survey of the breeding birds of Ladakh was carried out by Pratap Singh and R Jaypal (2000). Though a number of studies on diversity, distribution, relative abundance and status of avifauna (Jones 1947 a&b, 48, Ganguly 1967, Gaston et al 1981, 1993, Pandey 1989a, 1993, Mahabal & Mukherjee 1991, Mahabal & Sharma 1992, 1993, Narang & Singh 1995, Ramesh et al 1999, Mahabal 1996, 2000 a&b, 2005), Thakur et al. 2002, 2003, 2006 and Mattu and Thakur 2006 have been carried out in many parts of Himachal Pradesh, the Lahaul and Spiti areas of Himachal Pradesh have remained virtually unexplored especially with reference to studies on the Avian fauna except studies by Whistler (1923) and Koelz (1937). Recent investigations on the avian fauna from 2002 to 2006 in the Kaza area of Spiti valley is worth mentioning (Thakur and Mattu 2011).

MATERIALS AND METHODS

Most of the observations were made from a slow moving vehicle and care was taken not to disturb the birds by getting down from the vehicle unless absolutely necessary, for example for observing birds in thick brushwood or near water bodies. No bird or its part or nest was captured or disturbed while taking observations. All the observations were made during the day light hours only. While doing vehicular count, the observations were made by the two authors (GSB and SS) sitting on either side of the slow moving vehicle. Observations recorded included type of the contact (visual sighting, call or nest), name of the bird and its number, time and date, weather, topography, habitat type, substrate where the bird/birds was perching, name of the associated plant species and activity of the bird at the time of observation. Birds were observed and identified using 8 x 40 prismatic field binoculars. Most of the birds were also photographed with SLR cameras equipped with telephoto lenses for confirmation and record. Point location data was recorded with the help of a GPS - Garmin e-Trex Vista HCx. Bird identification was carried out with the help of various field guides (Ali & Ripley 1983, Grimmett et al 2011, Kazmierczak 2003). Nomenclature here followed is after Kazmierczak 2003. Survey was conducted in the cold desert of Kinnaur and Spiti valley of Himachal Pradesh in the month of June, 2012 with altitude ranging from 2006 metres to 4558 metres. The data was collected for 10 days, covering a linear distance of 705 kilometres (to and fro) from Reckong Peo to Kumjum pass and vice versa. 2803 minutes were actually spent on the collection of data through vehicular transect. Data was also collected between Rangreek Bridge and Kibber Wildlife Sanctuary. In addition observations were also made through foot transects, mostly in Kibber wildlife sanctuary, totaling a distance of 10 kilometers in 390 minutes. 272 minutes were also spent in data collection through point counts.

RESULTS AND DISCUSSION

A total of 79 bird species belonging to 22 families were observed during the survey in overall 1529 bird sightings. In terms of abundance family Fringillidae remains most dominant



Where, Ph= *Phytophagus*, Rp=*Raptors*, Sc=*Scavengers*, FSNI=*Fruit-seed-nectar-insectivores*, Om=*Omnivorous*, WI=*Water Insectivores*, SI=*Sallying Insectivores*, CI=*Canopy Insectivores*, GI=*Ground Insectivores* and Gr=*Granivores*

Figure 1

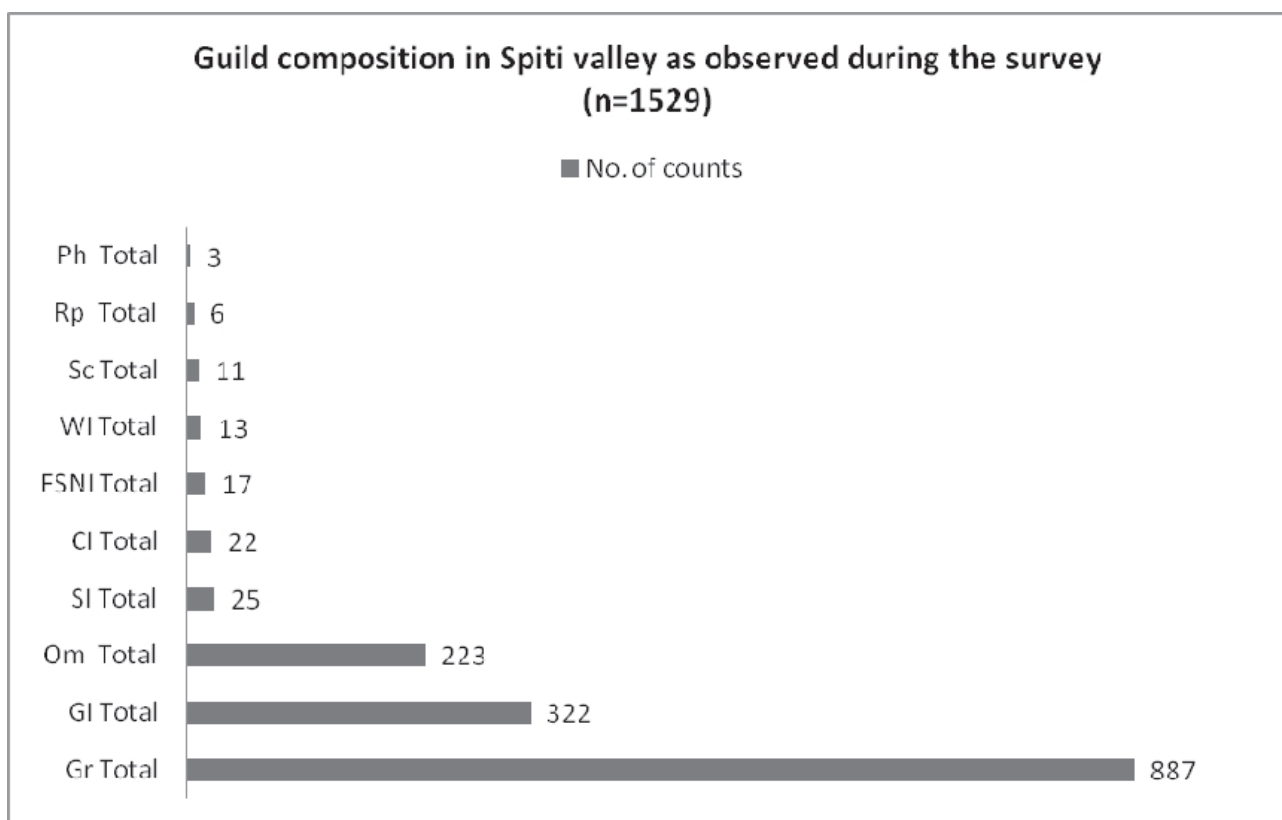


Fig 2

(n=306) followed by Muscicapidae (n=296), Corvidae (n=222), Columbidae (n=203), Ploceidae (n=179), Alaudidae (n=95), Emberizidae (n=87), Motacillidae (n=38) and so on. Table no.1 shows the abundance and corresponding number of bird species of different members of families as observed during the survey. Table no. 2 shows the checklist of bird species, their corresponding guild and altitudinal range as observed during the survey period. Black Redstart *Phoenicurusochruros* remained most dominant (n=181) among all species followed by House Sparrow *Passer domesticus* (n=179), Yellow-billed Cough *Pyrrhocoraxgraculus* (n=169), Tibetan Snowfinch *Montifringillaadamsi* (n=118), Horned Lark *Eremophilaalpestris* (n=92), Rock Pigeon *Columba livia* (n=87), Hill Pigeon *Columba rupestris* (n=72), Fire-fronted Serin *Serinuspusillus* (n=71), Rock Bunting *Emberizacia* (n=71) and so on (Table no.1). As the data was collected from RecongPeo itself some of the avian species of Himlayan region were also observed whose abundance gradually declined as we moved towards Pooh. These include Black-throated Tit *Aegithalosconcinnus*, Verditer Flycatcher *Eumyiaasthalassina*, White-capped Bunting *Emberizastewarti*, Black Drongo *Dicrurusmacrocerus*, Little Forktail *Enicuruscouleri*, Plumbeous Water Redstart *Rhyacornisfuliginosus*, Green-backed Tit *Parusmonticolus*, and Black Bulbul *Hypsipetesleucocephalis*. Decrease in their abundance can be correlated with the gradual decline in the tree cover consisting of *Pinusgerardiana* and also flowing fresh water streams. However the presence of White-capped Bunting *Emberizastewarti* remained in Pooh at an altitude of 3119 metres. Figure1 depicts a bar chart showing number of avian species as observed in different guilds during the survey.

Most of the bird species including sparrows, finches, snowfinches, rosefinches, serins, buntings and pigeons were observed in granivore guild (n=24) contributing 58.01% of all sightings (n=1529). House Sparrow *Passer domesticus* remained most dominant among granivores (n=179) and was seen most of the time near human habitations, though occasional sightings were also made in other areas including escarpments or soil banks where they were seen nesting in holes. It was followed by the Tibetan Snowfinch *Montifringillaadamsi* (n=118), Horned Lark *Eremophilaalpestris* (n=92), Rock Pigeon *Columba livia* (n=87), Hill Pigeon *Columba rupestris* (n=72), Fire-fronted Serin *Serinuspusillus* (n=71), Rock Bunting *Emberizacia* (n=61), Brandt's Mountain Finch *Leucosticte brandii* (n=40), Plain Mountain Finch *Leucosticte nemoricola* (n=38), Oriental Turtle Dove *Streptopeliaorientalis* (n=30), White-capped Bunting *Emberizastewarti* (n=26), Great Rosefinch *Carpodacusrubicilla* (n=15), Snow Pigeon *Columba leuconota* (n=14), Common Rosefinch *Carpodacuserythrinus* (n=11), Chukar *Alectorischukar* (n=10), Robin Accentor *Prunellarubeculoides* (n=7), European Goldfinch *CarduelisCarduelis* (n=5), Hume's Short-toed Lark *Calandrellaacutirostris* (n=3), Red-mantled Rosefinch *Carpodacusrhodochlamys* (n=2), White-browed Rosefinch *Carpodacusthura* (n=2), Mongolian Finch *Bucanetesmongolicus* (n=1), Scarlet Finch *Haematospizasipahi* (n=1) and Twite *Carduelisflavirostris* (n=1).

Eighteen species of ground insectivores were observed. These include redstarts, wheatears, stonechats, shrikes, wagtails, thrushes including bluethroat *Lusciniasvecica* contributing 21.06% of all counts. Black Redstart *Phoenicurusochruros* contributed most of the sightings in the group (n=181) followed by Pied Wheatear *Oenanthespeshanka* (n=32), Citrine Wagtail *Motacillacitreola* (n=20), Blue Rock Thrush *Monticolasolarius* (n=15), Desert Wheatear *Oenanthesdeserti* (n=12), White Wagtail *Motacilla alba* (n=11), Grey-backed Shrike *Laniustephronotus* (n=10), Sulphur-bellied Warbler *Phylloscopusgriseolus* (n=8), Blue Whistling Thrush *Myophonuscaeruleus* (n=6), White-capped Water Redstart *Chaimarrornisleucocephalus* (n=6), Common Hoopoe *Upupaepops* (n=5), Common Stonechat *Saxicolatorquata* (n=3), Streaked Laughing Thrush *Garrulaxlineatus* (n=3), White-winged

Table 1. Abundance and species richness as observed during the survey

S.No.	Family	Counts	Bird Species
1	Fringillidae	306	13
2	Muscicapidae	296	23
3	Corvidae	222	4
4	Columbidae	203	4
5	Ploceidae	179	1
6	Alaudidae	95	2
7	Emberizidae	87	2
8	Motacillidae	38	4
9	Hirundinidae	23	5
10	Accipitridae	12	3
11	Laniidae	12	2
12	Oriolidae	12	1
13	Phasianidae	10	1
14	Prunellidae	7	1
15	Falconidae	5	1
16	Upupidae	5	1
17	Cinclidae	4	2
18	Paridae	4	3
19	Pycnonotidae	4	2
20	Anatidae	3	2
21	Cuculidae	1	1
22	Dicruridae	1	1
Total		1529	79

Redstart *Phoenicurus erythrogaster* (n=3), Grey Wagtail *Motacilla cinerea* (n=2), Long-tailed Shrike *Lanius schach* (n=2), Tickell's Thrush *Turdus unicolor* and on one instance Bluethroat *Luscinia svecica* was seen on a river bed foraging the base of bushes. Streaked Laughing Thrush *Garrulax lineatus* was observed for three times at two different tree groves with poplar and salix species. Whereas earlier literature on Spiti valley does not show its distribution in this region of trans-Himalayas.

As observed during the survey, omnivores, comprising of four species of family corvidae namely Yellow-billed Cuckoo *Pyrrhocorax graculus*, Large-billed Crow *Corvus macrorhynchos*, Red-billed Cuckoo *Pyrrhocorax pyrrhocorax* and Common Raven *Corvus corax* contributed 14.6% of total bird sightings. Yellow-billed Cuckoo *Pyrrhocorax graculus* observed to be most dominant among the group (n=169) was seen most of the time near human settlements. The observations of sallying insectivores (swallows, martins and swifts) contributed only 1.63 % of all bird sightings. For one occasion each Black Drongo *Dicrurus macrocercus* and Verditer Flycatcher *Eumyias thalassina* was sighted. Canopy insectivores, though observed only for 22 times (1.44%) was represented by 11 species of leaf warblers, tits and one flycatcher. Mountain Chiffchaff *Phylloscopus indicus* was observed for seven times followed by Western-crowned Warbler *Phylloscopus occipitalis* (n=3), Hume's Lesser Whitethroat *Sylvia curruca* (n=2), Rufous-vented Tit *Parus rubiventris* (n=2), Tickell's Leaf Warbler

Table No. 2

Name of the species under observation	Guild	Counts	Alt. Range (m)
1. Black Redstart <i>Phoenicurusochruros</i>	GI	181	2100-4544
2. House Sparrow <i>Passer domesticus</i>	Gr	179	2158-4431
3. Yellow-billed Chough <i>Pyrrhocoraxgraculus</i>	Om	169	2529-4543
4. Tibetan Snowfinch <i>Montifringillaadamsi</i>	Gr	118	3666-4544
5. Horned Lark <i>Eremophilaalpestris</i>	Gr	92	3864-4558
6. Rock Pigeon <i>Columba livia</i>	Gr	87	2100-3977
7. Hill Pigeon <i>Columba rupestris</i>	Gr	72	2618-4447
8. Fire-fronted Serin <i>Serinuspusillus</i>	Gr	71	2266-4416
9. Rock Bunting <i>Emberizacia</i>	Gr	61	2066-4460
10. Brandt's Mountain Finch <i>Leucosticte brandii</i>	Gr	40	4046-4558
11. Plain Mountain Finch <i>Leucosticte nemoricola</i>	Gr	38	3642-4431
12. Pied Wheatear <i>Oenanthepleschanka</i>	GI	32	2538-3848
13. Large-billed Crow <i>Corvusmacrorhynchos</i>	Om	31	2006-3546
14. Oriental Turtle Dove <i>Streptopeliaorientalis</i>	Gr	30	2096-3590
15. White-capped Bunting <i>Emberizastewarti</i>	Gr	26	2254-2998
16. Red-billed Chough <i>Pyrrhocoraxpyrrhocorax</i>	Om	21	3033-4539
17. Citrine Wagtail <i>Motacillacitreola</i>	GI	20	3536-4551
18. Eurasian Crag Martin <i>Hirundorupestris</i>	SI	18	2298-4131
19. Blue Rock Thrush <i>Monticola solitaries</i>	GI	15	2088-3922
20. Great Rosefinch <i>Carpodacusrubicilla</i>	Gr	15	3291-4539
21. Snow Pigeon <i>Columba leuconota</i>	Gr	14	3720-4539
22. Desert Wheatear <i>Oenanthedeserti</i>	GI	12	2423-4458
23. Eurasian Golden Oriole <i>Oriolusoriolus</i>	FSNI	12	2695-3546
24. Common Rosefinch <i>Carpodacuserythrinus</i>	Gr	11	3549-4135
25. White Wagtail <i>Motacilla alba</i>	GI	11	2532-4111
26. Chukar <i>Alectorischukar</i>	Gr	10	2535-4358
27. Grey-backed Shrike <i>Laniustephronotus</i>	GI	10	3005-3696
28. Sulphur-bellied Warbler <i>Phylloscopusgriseolus</i>	UI	8	2842-4539
29. Mountain Chiffchaff <i>Phylloscopussindianus</i>	CI	7	3158-4108
30. Robin Accentor <i>Prunellarubeculoides</i>	Gr	7	4131-4417
31. Blue Whistling Thrush <i>Myophonuscaeruleus</i>	GI	6	2125-3162
32. Lammergeier <i>Gypaetusbarbatus</i>	Sc	6	4056-4539
33. White-capped Water Redstart <i>Chaimarrornisleucocephalus</i>	WI	6	2076-3819
34. Common Hoopoe <i>Upupaepops</i>	GI	5	3291-3812
35. Common Kestrel <i>Falco tinnunculus</i>	Rp	5	2290-4469
36. European Goldfinch <i>CarduelisCarduelis</i>	Gr	5	2267-3526
37. Himalayan Griffon <i>Gyps himalayensis</i>	Sc	5	2138-4463
38. White-browed Wagtail <i>Motacillamaderapatensis</i>	WI	5	2240-3543
39. Common Stonechat <i>Saxicolatorquata</i>	GI	3	3154-3855
40. Himalayan Bulbul <i>Pycnonotusleucogenys</i>	FSNI	3	2280-2853
41. Hume's Short-toed Lark <i>Calandrellaacutirostris</i>	Gr	3	3864-4296
42. Streaked Laughing Thrush <i>Garrulaxlineatus</i>	GI	3	2121-3526

43. Western-crowned Warbler <i>Phylloscopus occipitalis</i>	CI	3	2291-2853
44. White-winged Redstart <i>Phoenicurus erythrogaster</i>	GI	3	4162-4555
45. Brown Dipper <i>Cinclus pallasi</i>	WI	2	2067-2091
46. Common Raven <i>Corvus corax</i>	Om	2	4113-4143
47. Grey Wagtail <i>Motacilla cinerea</i>	GI	2	2229-2310
48. Hume's Lesser Whitethroat <i>Sylvia (curruca) althaea</i>	UI	2	2880-3050
49. Little Forktail <i>Enicurus scouleri</i>	WI	2	2095-2101
50. Long-tailed Shrike <i>Lanius schach</i>	GI	2	3346-3535
51. Mallard <i>Anas platyrhynchos</i>	Ph	2	3546-3578
52. Northern House Martin <i>Delichon urbica</i>	SI	2	3633-3746
53. Plumbeous Water Redstart <i>Rhyacornis fuliginosus</i>	WI	2	2093-2094
54. Red-mantled Rosefinch <i>Carpodacus rhodochlamys</i>	Gr	2	2702-3310
55. Rufous-vented Tit <i>Parus rubidiventris</i>	CI	2	2739-3526
56. Tickell's Leaf Warbler <i>Phylloscopus affinis</i>	CI	2	4070-4108
57. Tickell's Thrush <i>Turdus unicolor</i>	GI	2	3543-3546
58. White-browed Rosefinch <i>Carpodacus thura</i>	Gr	2	3353-3358
59. White-throated Dipper <i>Cinclus cinclus</i>	WI	2	4131-4338
60. Barn Swallow <i>Hirundo rustica</i>	SI	1	3423
61. Black Bulbul <i>Hypsipetes leucocephalis</i>	FSNI	1	2355
62. Black Drongo <i>Dicrurus macrocercus</i>	SI	1	2131
63. Black-throated Tit <i>Aegithalos concinnus</i>	CI	1	2210
64. Blue Throat <i>Luscinia svecica</i>	GI	1	3631
65. Common Swift <i>Apus apus</i>	SI	1	2116
66. Eurasian Cuckoo <i>Cuculus canorus</i>	FSNI	1	2872
67. Golden Eagle <i>Aquila chrysaetos</i>	Rp	1	3011
68. Green-backed Tit <i>Parus monticolus</i>	CI	1	2312
69. Greenish Warbler <i>Phylloscopus trochiloides</i>	CI	1	4105
70. Hume's Warbler <i>Phylloscopus humei</i>	CI	1	4108
71. Large-billed Warbler <i>Phylloscopus magnirostris</i>	CI	1	3526
72. Mongolian Finch <i>Bucanetes mongolicus</i>	Gr	1	3351
73. Pale Martin <i>Riparia diluta</i>	SI	1	3621
74. Rosefinch unknown	Gr	1	4134
75. Ruddy Shelduck <i>Tadorna ferruginea</i>	Ph	1	3506
76. Rusty-tailed Flycatcher <i>Muscicapara ruficauda</i>	CI	1	3526
77. Scarlet Finch <i>Haematospiza sipahi</i>	Gr	1	4307
78. Twite <i>Carduelis flavirostris</i>	Gr	1	3960
79. Verditer Flycatcher <i>Eumyias thalassina</i>	SI	1	2066

Where, Ph= Phytophagus, Rp=Raptors, Sc=Scavengers, FSNI=Fruit-seed-nectar-insectivores, Om=Omnivorous, WI=Water Insectivores, SI=Sallying Insectivores, CI=Canopy Insectivores, GI=Ground Insectivores and Gr=Granivores

Phylloscopus affinis (n=2), Greenish Warbler *Phylloscopus trochiloides*, Hume's Warbler *Phylloscopus humei*, Large-billed Warbler *Phylloscopus magnirostris* and Rusty-tailed Flycatcher *Muscicapara ruficauda*. During the survey they were seen always associated with the vegetation of Salix, poplar or apple orchards. The observation of Rufous-vented Tit *Parus rubidiventris* flitting to and from broad leaved tree groves (apple orchard in Pooh and poplar grove near Nako) is worth mentioning and to be treated as first record this part of trans-Himalayan region. The single sighting of Rusty-tailed Flycatcher *Muscicapara ruficauda* in the poplar-salix grove near Nako suggests the plant dependent limit of this species. Contributing 1.11% (n=17) of all sightings, the members Fruit-Seed-Nectar-Insectivore guild viz. Eurasian Golden Oriole *Oriolus oriolus* (n=12), Himalayan Bulbul *Pycnonotus leucogenys* (n=3), Black Bulbul *Hypsipetes leucocephalis* (n=1) and Eurasian Cuckoo *Cuculus canorus* (n=1) were observed associated with vegetation groves of Salix and Poplar. Water Insectivores constituting 0.85% (n=13) of all bird sightings (n=1529) remained confined near live streams of the area surveyed. These include White-browed Wagtail *Motacilla madagascariensis* (n=5), Brown Dipper *Cinclus pallasii* (n=2), Little Forktail *Enicurus scouleri* (n=2), Plumbeous Water Redstart *Rhyacornis fuliginosus* (n=2) and White-throated Dipper *Cinclus cinclus* (n=2). While Brown Dipper and Little Forktail were observed in the transition between cold desert and Himalayan region the rest species were observed in trans-Himalayan region.

The scavengers including Lammergeier *Gypaetus barbatus* and Himalayan Griffon *Gyps himalayensis* were seen only for 11 times (0.72%). Among two species of raptors (birds of prey) as observed during the survey, Common Kestrel *Falco tinnunculus* was seen for 5 times followed by Golden Eagle *Aquila chrysaetos* which was sighted only once. Among water birds only two species viz. Mallard *Anas platyrhynchos* and Ruddy Shelduck *Tadorna ferruginea* were seen during the period.

Observations of some of birds like Eurasian Golden Oriole *Oriolus oriolus*, Blue Whistling Thrush *Myophonus caeruleus*, Himalayan Bulbul *Pycnonotus leucogenys*, Long-tailed Shrike *Lanius schach*, Eurasian Cuckoo *Cuculus canorus*, Rufous-vented Tit *Parus rubidiventris*, Streaked Laughing Thrush *Garrulax lineatus*, Rusty-tailed Flycatcher *Muscicapara ruficauda* etc. particularly in tree groves of poplar and Salix as well as in apple orchards reveals the extra limit range extension of their distribution. This extension can be attributed to great gorge of Sutlej river where Spiti river joins possibly works as a bird highway for these local migrant bird species to reach cold desert of Spiti valley of Himachal Pradesh (Thakur and Mattu, 2011). This can also be attributed to the change in the life style of local people including a shift from traditional agricultural to horticultural practices in developing apple orchards and other fruit species coupled with plantation activities by state forest department and other agencies. These vegetation groves or orchards in the cold desert are like islands of pulsating diversity serving as refuge to these migrants.

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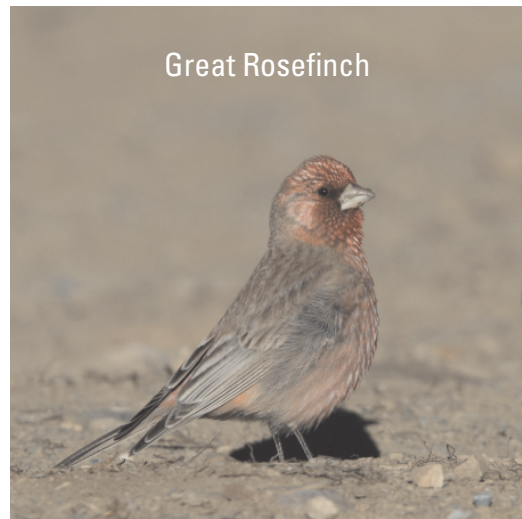




White Wagtail



Tickel's Leaf Warbler



Great Rosefinch



Bhavani river with deep pools and lush riverine forests



Sixty two pound orange- finned mahseer caught in Pilloor dam in 2014 by Gordon Thomson from Karamadai near Coimbatore

All Photos by
Dr. A.J.T. Johnsingh

Fish caught in the Pilloor dam by local fishermen, carp and cutla,



Angling to save the Humpback Mahseer in Bhavani River.

Dr. A.J.T.Johnsingh

Nature Conservation Foundation,
WWF-India and Corbett Foundation.

I surveyed the Pilloor dam and Bhavani River in the company of SM Karthik, Phillip Ross and Marcus Greenwood of Wildlife Association of South India (WASI) in the first week of January 2007. Based on this, I report that the chances of saving humpback mahseer in Pilloor dam and Bhavani river in Coimbatore Forest Division, Tamil Nadu may be good because of the dam and the several large deep pools in the river. There is also some potential to promote sport angling as part of **“Baralikadu” a well-run eco-tourism camp** which can help in saving the critically endangered mahseer, endemic to Cauvery basin.

Observations and suggestions:

Every fisherman presently using the dam should be given a **license/ identify card for fishing**. We could attempt to stop netting for a period of six months in the dam to help the recovery of the fish population there, with the introduction of fingerlings of rohu, catla, murrel and other carps on regular basis and feeding them with boiled ragi balls and ground nut cake. **We will need the support of the fisheries department for this**. Feeding should be done near Baralikadu camp also where one can plan sport angling. During these six months we could support fishermen, their number may not be high, to give some jobs related to the ecotourism program.

We could use float balls near the camp (Baralikadu) to mark the location where feeding is done, in order to totally ban netting in that location, as the site can be used by ecotourists to try their hand at angling. The eco-tourism program can **invest in few angling rods and rent** them for interested guests once the overnight camp is ready.

Four Irulas could be trained in angling by WAS and they can train the new anglers and act as gillies at the camp. They can also serve as fish guards to keep away illegal activities related to dynamiting and unregulated netting. On the evening of January 7, we saw five fishermen from outside the forest area coming up with coracle and fishing upstream of Athikadavu. **Outsiders fishing in the river should be totally banned and fishing in the river should be permissible only for the tribals**.

Sign Boards should be put up in Athikadavu, Mulli, Barali Kadu and near the police check post on the dam to create awareness about the humpback mahseer. The sign boards should say that the endangered humpback mahseer is endemic to the Cauvery basin which includes the Cauvery, Kabini, Moyar and Bhavani rivers. **A conspicuous sign board at Athikadavu bridge in Tamil and English warning people not to indulge in dynamiting the river—which is a major reason for the decline of mahseer and other fishes, should be put up as urgently as possible**.

According to Gordon Thomson, a fellow angler from Karamadai and who has caught several large mahseer in Pilloor dam, the major reason for the decline of mahseer in Bhavani River is dynamiting which is done when the fish leave the safety of the dam and ascend the river to spawn after the monsoon. The fish is said to range into the Kerala part of the Bhavani River too where dynamiting is reported to be rampant. In the late 1980s, Gordon and Donald Anderson (son of Kenneth Anderson) caught a 24 kg (53 pound) mahseer below the Athikadavu

bridge using a spinner.

The program suggested above eventually can even attract **foreign anglers to visit** Baralikadu ecotourism camp. All the above can help in creating awareness about the humpback mahseer and generate additional income for the tribals.

T. Karthik, from WASI and originally from Tamil Nadu, who was an extremely valuable member during our recent visit, is willing to work with the Forest Department and OSAI to implement the above suggestions.

Other observations and suggestions:

We found the Bhavani river landscape rich in bird species including the Great and Malabar Pied Hornbills and the Stork-billed Kingfisher. Calls indicated that Grey Jungle fowl are abundant. The riverine forest is extremely scenic. While staying in Mulli we put up a camera trap 50 m from the rest house and photographed animals such as palm civet, mouse deer, wild pig, chital, gaur and leopard. Sighting sound of leopard call was heard near the rest house. Tracks of a tiger were seen upstream of Athikadavu bridge. Elephants were seen several times including a large tusker unperturbed and watching us seated in the vehicle, 15 m from him. **Please note that no sambar was seen. During our five nights stay not even alarm calls were heard.** In a hilly area like Coimbatore Forest Division '**sambar conservation is tiger conservation**'. Unregulated poaching in the past with dogs and snaring may be the reason for the near absence of sambar in the Bhavani landscape. Interestingly, we learnt that the Irulas, the local tribe, need some sambar meat to complete the religious formalities related to the death of a person in their community. This may explain the near absence of the sambar and the Irulas should be weaned off this practice.

We found an abundance of the cactus *Opuntia dillenii* in the forests. This species has the capability to spread and make the habitat unsuitable for large mammals. Special efforts should be taken as urgently as possible to control this species which will be a challenging task as the plant being tenacious keeps sprouting back from roots and buried stems.

Under the eco-development programs the tribals should be encouraged to grow firewood species (eg., *Dalbergiasisoo*, *Casuarina equisetifolia*, *Greweliarobusta*, *Acacia auriculiformis*) and fodder species for their goats (eg., *Bauhinia purpurea*, *Erythrina indica*, *Muntingiacalabura*, *Sesbania grandiflora*). In fact throughout the country people should be encouraged to grow fodder and firewood outside the forest area and not collect them from the forests. Presently there is unregulated feeding by the goats in the forests. The tribals could also be encouraged to grow *Melia dubia* for timber. The fruits of this tree are avidly eaten by all ungulates including goats.

Government may put up the electric fence to protect the crops the tribals grow but the tribals should be trained and persuaded to maintain them. **Solar panels to power their batteries to operate the fence should be provided to them as urgently as possible.** Now the tribals have the onerous task of taking the batteries to Karamadai for charging which is close to 30 km from their settlements. When we visited Veppamadathoor hamlet we found that a bull elephant had damaged their grown-up banana crop because of the non-functional electric fence.

The beautiful riverine forests should not be allowed to be impacted by wood cutting by the tribals. On the contrary we should work with them to develop a conservation program to

regenerate the riverine forests by planting saplings of suitable species which lack regeneration. Almost all the species that have grown large (eg., *Diospyros peregrina (malabarica)*, *Hopea parviflora*, *Madhuca longifolia*, *Mangifera indica*, *Terminalia arjuna* and *T. belerica*) lack regeneration.

The forests should be kept plastic free and no plastic should be burnt in the forests. Burning of plastic in millions of places in the country is possibly one major reason for the erratic rainfall which shows signs of drastic reduction. All plastic from the forests (police and forest camps, Pilloor dam electricity colony and tribal colonies), should be collected and taken down to Karamadai town and deposited in the garbage dump there. Under the ecodevelopment program the tribals can be assigned this task. I wish that soon the forests of Bhavani landscape ring with the alarm calls of sambar stalked by tiger and the deep pools of the Bhavani River again become the home of the mighty mahseer. These should be the goals for the Coimbatore Forest Division.

Acknowledgment: Thanks are recorded to Janhavi Rajan for reading through this article. Wonderful companionship of Karthik, Phillip and Marcus in the field and the logistic support of Sandeep Chakravarthy are kindly acknowledged. Should be recorded that under the leadership of Karthik WASI trained four tribal youth from Baralikadu Ecotourism Camp in catch and release angling in June 2017 in the Wasi lake on the bank of Cauvery River near Sivanasamudram falls.



*One of India's leading naturalists and field biologists; carried out a study on dholes (*Cuon alpinus*) in Bandipur Tiger Reserve in the late 1970s (first such a study on free ranging large mammals in India), research at the Smithsonian Institution, USA, and the Bombay Natural History Society (BNHS); retired in 2005 as Dean Faculty of Wildlife Sciences, from Wildlife Institute of India Dehradun after training a generation of wildlife biologists and forest officers.*

Fishing Gears Used in Kheri District of U.P.

Dr. Vijay Prakash Singh* & Dr. Namita Baranwal**

ABSTRACT

The term “Fishing gears” refers to all those implements and devices that are in vogue for catching fish. Fishing seems to be one of the earliest techniques used by the man to capture food. The hand spear was one of the earliest techniques to take fish.

Fish being a high-class edible commodity and not so easily available as it lived in water, fascinated the mankind from time immemorial. There has been a gradual evolution in development of fishing gears. The factors responsible for the development of modern fishing gears are : Desire to change from the catching of a single fish to catching fish in bulk; Need to fish in deeper water to catch more fish; and Desire to increase the efficiency of the fishing gear. As a result, more sophisticated larger efficient gears than the simple, small wooden gear of the past have been developed.

INTRODUCTION

Before the invention of any fishing gear, men used their hands (hand picking) along the shores of lakes, rivers and seas to catch fish and other aquatic organisms. This method is still prevalent throughout the country (Fig:1). Usually fish caught by groping are murels, spiny eels, *Anabas*, *Clarias* singhi, *Glossogobius* etc.

CLASSIFICATION OF GEARS

Various type of gears are used for fishing. These gears can be classified as suggested by Von Brandt (1958). We classify them as under:

1- Without gears – This includes hand-picking, fishing with feet, simple tools for catching fish etc.

2- Grappling and Wounding gears – Fishes are caught by grappling, squeezing, piercing, transfixing or wounding. Fishing implements used are – spoon, clamps, tongs, rake harpoons etc.

3- Stupefying device – Fishes are caught by stupefying or stunning.

4- Hooks and long lines

5- Traps

6- Fishing in the air-aerial traps

7- Bag nets

8- Dragged nets – This includes all nets and gears which are towed through the water including dredge and all vertical nets dragged through water.

9- Seine nets – It consists of long wings and touring traps with or without bags.

10- Surrounding nets – These nets may completely encircle a detected fish shoal not only from the sides but also from the bottom.

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11- Drive-in-nets – Fish are caught by driving them into the gears by swimming or during fishing.

12- Lift nets – The sheets of netting lowered into the water and lifted when the fish swim over them or creep on bottom.

13- Falling gears – Fishes are covered with a gear which is normally operated in shallow water.

14- Gill nets – Fishes are caught by the principle of gilling. These nets (Fig 2) are operated as drift nets anchored to the bottom and are fished close to the bottom in mid water or as the surface.

15- Tangle nets – Fishes are caught by entangling.

(I) Drag net without pockets

(i) Mahajal :

This net is rectangular in shape and is comprised of about 50 or less pieces, depending on the requirement, made of hemp. Each piece is 7-14 m long and 03 to 08 m wide with mesh size 5.8 to 6.5 cm (stretched). Generally 10-15 men are engaged to operate the net. One end of the net is left on the shore and the other half of the party gradually pay out the rest of the net from the boat in a semicircle enclosing the water body. The net is operated in rivers, the Sharda barrage and big natural lakes during the month November to April with the peak period being December to February. Big-sized carps and catfishes are the dominant species being caught by the net.

(ii) Monofilament net :

It is a simple drag net made of monofilament nylon piece (Fig 3). It is regular in shape and is used in small natural lakes and ponds. Each piece is 20 m long or less and 1.1 m wide with a uniform monofilament mesh. About 8-10 people are employed for the operation of the net in less deep waters. This net is used during November to April. The species caught are Indian major carps, *Aorichthys* spp, *Mystus* spp, *Wallago attu*, murrels, spiny eel and small *Puntius* spp and other weed fishes, fry and fingerlings of culturable carps etc.

(iii) Chaundhijal :

This is a small drag net of cotton consisting of 14-15 pieces, each 24m large and 1.12 m wide with a uniform mesh of 10.2 cm (stretched). The pieces have 600 meshes area and 11 meshes in depth. Small-sized catfishes like *Mystus* spp., *Wallago attu*, carps, etc. are caught.

(iv) Chhantajal (with pockets) :

This net is made of cotton, usually composed of 4-5 pieces, each 9.3m long and 3.50 m wide with a size of 7.0 cm mesh (stretched) in the first strip and 5.5 cm in the lower three strips. There are about 80 meshes vertically across its depth. The method of its operation is similar to that of other drag nets. Small-sized fish such as catfish, carps etc. are caught in the pockets of the net.

Hook and lines :

Hooks and lines as described under the fishing gears of India, are used in District Kheri Lakhimpur. The fish caught are small weed fishes, carps and catfishes.

The length of the gear line is 30-40 m. At the end of the each line another is attached until a long string of gear and holding hundreds of baited hooks has been set.

Such type of fishing is frequently seen in Sharda river specially close to Sharda Nagar

and near bridge on Sharda and Bhira-Palia road as well as in big lakes.

Traps :

This trap is locally called *trapa*, similar to 'Kuriar' trap, consisting of two bamboo sticks each 85-87 cm long, tied at one end to a wooden or iron ring of 22 cm diameter. A conical net having six sides, is attached to the free ends of bamboo skeleton from the inner side. The trap is operated in shallow water, with the aid of a single man (Fig. 4 a-b).

Scoop Net

Pakaila Net :

This is a very common type of net in Kheri district described under dip net, hand net and scoop net. A piece of net about 75 cm in length is attached to two bamboo poles each about 2.75 m long forming a 'V' shape structure. In district Kheri – Lakhimpur, only two bamboo poles are used. The net is operated by a man from a small boat or without boat in shallow water. Small fishes like *Cirrhinus reba*, *Puntius* spp. *Mystus* spp. Rita major carp young are and juveniles, etc are caught.

Fishing boats:

Two types of boats are used : larger and dongi boats (Fig 5 a-b). The dongi boat is 6 m long, 1.5 cm wide in the centre and 45 cm in depth. The boat is very light and handy and can be operated by one man only.

When big net like Mahajal is operated, bigger boats are used. The boat is about 9.95 m long and has one tapering end and the other flat end. It is 90 cm deep. The flat end is 3 m wide with a space of 2 m in length for keeping the net. Three or four raised platforms about 15 cm wide are used on which the net is kept. The middle part about 4 m in length is made of wooden planks and is used by a large fishing party. About 2-4 men sit near the tapering end to row the boat.

DISCUSSION

A general description of the fishing gears as used in freshwater bodies such as rivers, lakes and ponds have been broadly classified into :

- Fishing implements
- Traps and barriers
- Hooks and lines and Nets

In the present investigation a general survey of commonly used nets in Districts Kheri-Lakhimpur in natural lakes and ponds was conducted and description of some of the commonly used gears has been dealt with. Among drag nets (without pockets) Mahajal, monofilament drag net and Chhantajal and Chaundhijal (with pockets) are generally used. Monofilament drag net is commonly used to catch all-sized fishes from a natural water body. As these waters are generally choked with weeds, Chhantajal of gill net is used. This net is also helpful in catching the bottom dwelling fish : like common carp, calbasu, mrigal in ponds or *Clarias batrachus*, singhi, murrels etc. in the lake.

As regards the fishing boats, a small *dongi* boat is used with almost other types of net. Sometimes bigger boats are used when bigger drag nets are operated in a large area.



Fig. 1 : Hand picking fishing gear which is mostly common for bottom dweller fishes.



Fig – 2 : Seining by Gill Net



Fig. – 3 Operation of monofilament drag net in lake.



Fig-4 (a and b): Constructional details of traps and its mode of operation in Ibrahimpur lake.



Fig – 5 (a) : Pakaila net with bigger boat.



Fig – 5 (b) : Pakaila net with dongi boat.

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Observations on the mammals in Kalatop-Khajjiar Wildlife Sanctuary and adjacent areas, Himachal Pradesh, India

Anil Kumar*

ABSTRACT:

Kalatop Khajjiar Wildlife Sanctuary is a biodiversity rich area of Himachal Pradesh. Field surveys were undertaken to document the mammals of this area from 14.09.2010 to 20.09.2010, 30.03.2012 to 03.04.2012 and 12.06.2012 to 16.06.2012. On the basis of direct sightings and secondary information, total fourteen species of mammals (excluding one unidentified bat) belonging to 5 orders and 11 families were recorded in the present study. It includes some rare/ interesting records.

INTRODUCTION

Kalatop Khajjiar Wildlife Sanctuary (here after KKS) is located in the western Himachal Pradesh. Earlier, the sanctuary area was 61 km², which has now been reduced to 17.17 km² subsequent to rationalization by State Government (vide notification no. FFE-B-F(6)11/2005-II/Kalatop-Khajjiar dated 7th June 2013). The habitats comprised of sub-alpine forest, sub-tropical forest, broad-leaved forest and alpine moist pasture. The sanctuary is located in the catchment area of Ravi River. The Kalatop and surrounding area contains thick patches of Cedar, *Cedrus deodara* followed by Ban Oak, *Quercus incana*, Blue Pine, *Pinus wallichiana*. Khajjiar is a meadow surrounded by Cedar (Islam and Rahmani 2004; Kumar et al. 2014).

Some areas of the sanctuary are steep to very steep in terrain, with rocky cliffs. The area is drained by a number of perennial tributaries of Ravi. The area support fairly good number of faunal elements such as birds namely Kaleej Pheasant *Lophura leucomelanos*, Koklass Pheasant *Pucrasia macrolopha*, Cheer Pheasant *Catreus wallichii* and Himalayan Monal *Lophophorus impejanus*, and mammals namely Goral *Nemorhaedus goral*, Serow *Nemorhaedus sumatraensis*, Asiatic Black Bear *Ursus thibetanus* and Indian Muntjac *Muntiacus muntjak* (Thakur et al. 2002; Singh and Banyal 2012). Review of literature revealed that studies are scanty and the fauna of the sanctuary is not well documented. To fill the gap in information it was planned to document the fauna of this area. Present article is aimed to document the mammals of this sanctuary and adjacent localities.

MATERIALS AND METHODS

For the documentation of mammals, field surveys were undertaken from 14.09.2010 to 20.09.2010, 30.03.2012 to 03.04.2012 and 12.06.2012 to 16.06.2012. Four major tracks (namely Lakarmandi-Kalatop, Lakarmandi-Dankund, Lakarmandi-Khajjiar and Lakarmandi-Dalhousie) were either walked on foot or covered with vehicle with slow speed with intermittent breaks for point surveys (at 300 to 1000 m intervals). Survey localities such as Khajjiar Lake and adjacent areas, Kalatop area, Dankund area and one unnamed locality between Lakarmandi and Dalhousie were surveyed extensively. Observations were made between 5.30 am to 9.00

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pm (with few exceptions) with the help of prismatic field binocular (7x35) and identification of species was carried out with the help of a field guide to Indian mammals by Vivek Menon (2003). At the time of preparation of manuscript, the latest version of 'Indian Mammals' (Menon 2014) was also consulted. Indirect evidences such as dung, digging marks, sightings by reliable forest staff, were also considered to infer the occurrence of a species.

RESULTS AND DISCUSSION

On the basis of direct sightings and secondary information, total fourteen species of mammals (excluding one unidentified bat) belonging to 5 orders and 11 families were recorded in the present study (Table 1). It includes some rare/ interesting records. Most dominant groups were order Carnivora having five species followed by order Rodentia represented by four species. Total ten species were sighted directly, while occurrence of four is based on secondary information. One species of was sighted but could not be identified.

In the present investigation, occurrence of Asiatic Black Bear *Ursus thibetanus* was confirmed with the help of vocalizations and fresh digging marks (fig. 1). Ghoral Naemorhedus goral (fig. 2) was sighted directly several times. Troops of two species of primates i.e. Central Grey Langur *Semnopithecus schistaceus* (fig. 3) and Rhesus Macaque *Macaca mulatta* (fig. 4) were observed on the way to Khajjiar. On 17.09.2010, a troop of more than 25 individuals of Central Grey Langur was observed about 3 km adjacent to Khajjiar. They were foraging on unripe walnut fruits. A troop of 9 individuals of Rhesus Macaque was observed near Khajjiar. Presence of Red Giant Flying Squirrel *Petaurista petaurista* was also confirmed. It was observed during night surveys only. The calls were also recorded. It had a bi-syllabic, loud stereotype vocalization. Habitats in sanctuary area are dense and intact and provide enough shelter to wildlife. However, outside the sanctuary, forests are fragmented and affected by degradation. Review of literature revealed that information on the mammals of this area is not documented (Singh and Banyal 2012).

Species accounts

1. ***Semnopithecus schistaceus* Hodgson, 1840**

Common Name: Central Himalayan Langur or Nepal Gray Langur.

Morphological Characters: The length of head and body is about 600 to 700 mm; tail is 550 mm to about 650 mm. The weight of adult male is up to 26 kg. Langurs are usually uniformly coloured, the upper parts are generally greyish, or blackish, and the under parts are lighter. Colour and size varies place to place. They have slender bodies, long tails, and long, slender hands.

Distribution: In the Himalayan hills from 1500 to 4000 m. in Uttarakhand, Himachal, Jammu & Kashmir and Sikkim. Apart from this it is found in Afghanistan, Pakistan, Nepal and Bhutan.

IUCN Status: Least Concern.

Remarks: Commonly observed in the area.

2. ***Macaca mulatta* (Zimmermann, 1780)**

Common Name: Rhesus Macaque.

Morphological Characters: The length of head and body is about 450 to 600 mm; tail is short. The adult males weight up to about 12 kg. The colouration is usually yellowish brown above and lighter below, rump has orange fur which makes it distinctive from other Indian macaques. Tail pattern varies in male and females.

Distribution: North and east above Tapti and Godavari rivers. Found in Afghanistan, Nepal, Bhutan, Myanmar, Indo-China, Tibet, China, Thailand, Hong Kong, and Mongolia.

IUCN Status: Least Concern.

Remarks: Regularly seen in the area.

3. Muntiacus muntjak Zimmerman, 1780

Common Name: Indian Muntjac.

Morphological Characters: It is a small deer measuring about 41-60cm at shoulder. It has comparatively short and thin legs give the animal rather stocky appearance. Fur colour is glossy dark chestnut with throat, belly and inner side of the legs whitish. Males have two bony pedicles covered with skin on which short deciduous horns are grown. Two bony ridges come down from the base of pedicles beyond the level of the eye which has given rise it's another name rib faced deer.

Distribution: Distributed throughout the country except Jammu and Kashmir and desert region.

IUCN Status: Least Concern.

Remarks: Rarely seen in the sanctuary area.

4. Capricornis thar Hodgson, 1831

Common Name: Himalayan Serow.

Morphological Characters: It appears a goat like animal with long ears, having reddish-black coat. The tail is dark and the rump, forearm and gaskin are rufous with creamy shanks. The hooves are black. Horns are short, conical, wrinkled and thicker in the males.

Distribution: Southern slopes of Himalaya from Jammu & Kashmir in the west to Arunachal Pradesh in the east. The sub-species (enigmatic red form) found in Meghalaya, Manipur, Mizoram, Tripura and Nagaland. Also found in southern China, Nepal, Bhutan, Bangladesh and possibly in north-eastern Pakistan.

IUCN Status: Near Threatened.

Remarks: Rarely seen in the area.

5. Naemorhedus goral (Hardwicke, 1825)

Common Name: Goral.

Morphological Characters: It is a goat like animal with large bell shaped ears and backwardly curved small ringed horns. Horns of the male are thick and more divergent than females. Overall coat colour is greyish brown with white patches on upper lip, chin, throat and neck, A distinctive black band runs through the spine. Tail is longer than the wild goat, extended below belly.

Distribution: It is distributed in Bhutan, China, Korea, Myanmar, Pakistan Tibet. In India Himachal-Pradesh, Jammu and Kashmir, North-eastern States, Uttar-Pradesh, Sikkim and West Bengal.

IUCN Status: Near Threatened.

Remarks: Commonly observed in the sanctuary area.

6. Panthera pardus Linnaeus, 1758

Common Name: Common Leopard.

Morphological Characters: It has a yellow coat marked with black rosettes with white underside. Size is 203-243 cm in males and 180-208 cm in females. Weight is about 45-77 kg in males and 30-45 kg in females. It has a spotted head, long tail and powerful jaws. The colour of coat varies considerably

Distribution: Throughout the country except arid parts of Kutch and Rajasthan, and higher Himalaya (up to 3000 m). Widespread in sub-Saharan Africa and parts of Asia.

IUCN Status: Vulnerable.

Remarks: Reported by villagers from low altitude areas of sanctuary, but rarely seen.

7. Felis chaus Schreber, 1777

Common Name: Jungle Cat.

Morphological Characters: A medium sized cat is about 59-76 cm in body length. The legs are long and tail is short. Body colour varies from yellowish grey to tawny rufous on dorsal side and paler on ventral side. The limbs have black and yellowish grey transverse bars, tail is black at tip.

Distribution: Afghanistan, Algeria, Benin, China Egypt, Iran, Iraq, Israel, Kenya, Malawi, Morocco, Mozambique, Myanmar, Nepal, Pakistan, Sri Lanka, Syria, Thailand, Vietnam, Yemen, Zambia and Zimbabwe. In India, Uttarakhand to south of Krishna river in south India, Gujarat, Jammu and Kashmir, Madhya Pradesh, Rajasthan, Sikkim, Uttar Pradesh and West Bengal.

IUCN Status: Least Concern

Remarks: Often seen in the area.

8. *Vulpes vulpes* (Linnaeus, 1758)

Common Name: Himalayan Fox.

Morphological Characters: The length of head and body is 600 to 700 mm. The adult animal weighs up to 9 kg. The reddish upper parts, except black ears, paler under parts and white tail tip makes it distinct from other foxes.

Distribution: Throughout Palearctic region, Europe, continental Asia, Indo-China, Japan, Palearctic Africa, North America and Australia. In India, Uttarakhand, Rajasthan, Gujarat, Punjab, Kashmir, Himachal Pradesh, Sikkim and Uttar Pradesh.

IUCN Status: Least Concern.

Remarks: Often seen in the area.

9. *Ursus thibetanus* (G. Cuvier, 1823)

Common Name: Asiatic Black Bear

Morphological Characters: It is a large size bear with smooth and shining black fur. Claws on the forelegs are horny, short and sharply curved and thus adapted for tree climbing. V-shaped white coloured mark present on the chest. Four premolars and six incisors in the upper jaw are present. Males are always larger in size and weight than females.

Distribution: It is found in Afghanistan, China, Formosa, Indo-China, Japan, Korea, Laos, Manchuria, Myanmar, Nepal, Pakistan, Siam, Siberia in Russia, Taiwan, Thailand and Vietnam. In India, it is distributed in Himachal Pradesh, Jammu and Kashmir, North-eastern states, Sikkim, Uttar Pradesh and West Bengal.

IUCN Status: Vulnerable.

Remarks: Often seen in the area.

10. *Martes flavigula* Boddaert, 1785

Common Name: Yellow-throated Martin.

Morphological Characters: The yellow-throated marten is the largest marten in the Old World, with a tail more than half its body length. Its fur is brightly colored, consisting of a unique blend of black, white, golden-yellow and brown. It is an omnivore, whose sources of food range from fruit and nectar to small deer. The yellow-throated marten is a fearless animal with no natural predators, because of its powerful build, its bright coloration and unpleasant odor. It shows little fear of humans or dogs, and is easily tamed.

Distribution: Eastern Russia, south to the Malay Peninsula and Sunda to Taiwan. It occurs in central and northeastern China and the Korean Peninsula. The yellow-throated marten is well distributed, but uncommon throughout mainland Malaya. It also occurs in the central mountain range and the southern areas of Taiwan. In India, it is reported in the northeast Indian states of Arunachal Pradesh, Manipur, Himalayan West Bengal and Assam and in Burma. It occurs in sub-tropical and tropical forests from the Himalaya.

IUCN Status: Least Concern.

Remarks: Often seen in the area.

11. *Hystrix indica* Kerr, 1792

Common Name: Indian Crested Porcupine.

Morphological Characters: The head and body length ranges from 600 to 900 mm and the tail small less than one-fifth of head and body length. The body build is massive, head and neck possess long and brown crest of bristles, shoulders and belly with coarse and back covered with long quills. Quills have alternate bands of white and brown.

Distribution: Israel, Nepal, Pakistan, Russian Turkistan and Sri Lanka. Widespread in India.

IUCN Status: Least Concern.

Remarks: Rarely seen in the area.

12. *Petaurista petaurista* (Pallas, 1766)

Common Name: Red Giant Flying Squirrel.

Morphological Characters: It has a membrane of skin between its legs, which is used to glide between trees. It is characterised by its dark red colouring and large eyes. When compared to other species of squirrels, this species is large, being on average 422 mm long. Entire body dark reddish except for black on nose, chin, eye-ring, behind the ears, feet and tail tip. It forages mainly on conifer cones, leaves and branches, and, when in season, fruits and nuts, and occasionally insects. It is able to glide for long distances (up to 75 m or greater). Their nest holes usually at least 10 m above ground. It is nocturnal and does not hibernate, but migrates to areas with abundant food.

Distribution: It is found from the eastern regions of Afghanistan, into northern India and Pakistan through to Java, and Taiwan, and also Sri Lanka. It can also be found in parts of Borneo. This species was recorded in Peninsular Malaysia, included Penang and also Singapore.

IUCN Status: Least Concern.

Remarks: Commonly observed in the sanctuary area.

13. *Mus musculus* Linnaeus, 1758

Common Name: House Mouse.

Morphological Characters: Head and body length ranges from 55 to 94 mm and the tail from 64 to 99 mm. Body fur are soft, sandy brown to dark brown above and white to brownish below. Tail is faintly darker above and whitish below.

Distribution: Worldwide.

IUCN Status: Least Concern.

Remarks: Often seen in the area.

14. *Rattus rattus* Linnaeus, 1758

Common Name: House Rat.

Morphological Characters: Length of head and body ranges from 116 to 203 mm and the tail from 159 to 256 mm, longer than head and body length. This species varies in body coloration, indoor forms are brownish above and greyish buffy below, out doors are creamy with greyish medial streak on the back, rest characters are same in both the forms.

Distribution: Worldwide in tropics and temperate zones.

Status: Least Concern.

Remarks: Often seen in the area.

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Figure 1. Digging marks of Asiatic Black Bear.



Figure 2. Ghoral was sighted in Kalatop area.



Figure 3. Central Grey Langur was seen in Khajjiar



Figure 4. Rhesus Macaque on the way to Khajjiar.

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Dr. Anil Kumar is a senior scientist in Zoological Survey of India, Dehradun. He did his Ph. D. in Zoology in 1999 from Gurukul Kangri University, Haridwar. Over the years, he is working on avifauna, mammals and songs & calls of birds, of the Himalaya. He has worked in Arunachal Pradesh, Himachal Pradesh, Ladakh, Uttarakhand, Uttar Pradesh, Thar Desert of Rajasthan and Antarctica.

Photography as Conservation Tool

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'Photography', derived from Greek words *photos* and *grapho*, literally means 'light drawing'. Its origin has been obscure, as there was more than one pioneer who developed the concept and refined it further, all through the 1800s on both sides of the atlantic ocean, with no one in particular fully credited to be its inventor or originator. The present 'avatar' of photography, as we know it, came into being around 1888 when, after much experimentation, the Kodak camera was released in market by George Eastman in America; making photography uncomplicated, easily accessible and popular by 1901.

Nature, and its flora and fauna, has been the favorite subject of photographers world-wide, who mostly indulged in capturing its resplendent beauty. Very few of them dared to present the stark reality of animal kingdom and its ever-shrinking environment, its constant struggle to survive in the face of encroachment by mankind, pushing them over the brim of extinction. And all this has been happening in the name of 'development' – a one-sided approach by man, the self-proclaimed 'superior-most' species existing on earth today. For him, every other species is dispensable; and if it becomes extinct, so be it!

The newspapers today are full of reports on man-animal conflicts, which often end up with the death or grievous injury, either sustained by man or the animal. This conflict is the culmination of an inconspicuous shift in the delicate balance between man and animal; be it the encroachment of the wild animal habitat, trespassing through their natural corridors, unscrupulous robbery of the resources essential for their existence, damage to the environment by illegal excavation of riverbeds, minerals, chopping of trees for wood, robbing valuable natural wealth of local flora, or poaching of animals for the extracting mythical medicinal substances. Most of these activities often go un-noticed from the eyes of un-aware citizens. Only in the aftermath of an unfortunate altercation, do we come to realize the sequence of largely preventable events that culminated the final tragedy.

This led to the development of a branch of photographic skills that went ahead and documented changes happening around us which, if left un-noticed or un-documented, will one day lead to a major disaster, damaging the environment and climate, affecting adversely everyone and everything that exists within it.

'Conservation Photography' as a discipline is a relatively new concept; recognized as an independent category starting around year 2005. It combines nature photography with the proactive, issue-oriented approach of documentary photography, serving as an agent for sustaining the biosphere and ethnosphere. Conservation Photography furthers environmental or cultural conservation through ethical photography. In other words, conservation photography is as much about what a photographer does with the photo - what that photo is used for after it is taken - as it is about the subject or beauty of the image itself.

The International League of Conservation Photographers is at the forefront of this new discipline. Its mission is to translate conservation science into compelling visual messages targeted to specific audiences. These photographers work hand-in-hand with leading scientists, policy makers, government leaders and conservation groups to produce the highest-quality

documentary images of both the beauty and wonder of the natural world and the challenges it is facing presently. The aim is to conserve what is left of our critically damaged environment, with spread of awareness and sense of ownership amongst public, and to make efforts to revert this damage by our modern knowledge of science and technology.

Conservation Photography needs, besides excellence in art of photography, an endless dedication, a deep understanding of the climate and environment, and the sensitivity to recognize and visualize the future impact of inconspicuous and somewhat mundane situations that are constantly evolving around us, every day.

Conservation photography today, is one area in which some of the best photographers in the world are spending their energies, using the power of photos to conserve natural spaces. Cristina Mittermeier, the founder of [International League of Conservation Photographers](#), used to be a biochemical engineer, focusing specifically on marine sciences, but took to photography in order to create a more immediate impact on conservation. She developed the skill of wielding a camera which, combined with her dedication towards nature conservation, made her a name to reckon with, when in year 2010, she was named one of the 40 most influential Nature Photographers by Outdoor Photographer Magazine, and was named Conservation Photographer of the Year by Nature's Best Photography.

Some other top names, who are dedicated full time to Conservation Photography around the world, are Alison Jones, Chris Linder, Neil Ever Osborne and Paul Nicklen. All these stalwarts were at one point of time, pursuing diverse professions, till their sense of responsibility towards conservation of nature and its treasures turned them into environmental activists and torch-bearers, dedicated to educate the public about role of science in saving our climate and ecosystem; to inspire the next generation of researchers; and to communicate the need to protect wild spaces and its flora and fauna. Today, their stunning images are used to hammer home the importance of nature conservation.

A mammoth project, one of its kind, has been the Photo-Ark, founded by photographer Joel Sartore, who took upon himself the task of clicking photograph of every surviving or rapidly disappearing species of animal kingdom, living in captivity. The project started around year 2005, in collaboration with National Geographic Society, with when Joel started photographing animal species, in order to bring about public awareness, and make people care about their fate. Today this photo document has reached gigantic proportions, with photographs taken of more than 7000 species, and growing every day, one picture at a time! The National Geographic Photo Ark is teaching people of all ages about our planet's amazing biodiversity and fostering a real human connection to Earth's animals. The project engages students in the classroom through free educational materials and activities, and inspires the public through special exhibitions and events around the world. An estimated 12,000 species of birds, fish, mammals, reptiles, amphibians and invertebrates will be photographed in the project. Once completed, Photo Ark will serve as an important record of each animal's existence, and a powerful testament to the importance of saving them.

In order to take first step towards conservation photography, one does not need a huge set-up or a formal technical education; just keen observation power and an understanding of the local environment. A simple idea of documenting the local flora or fauna around you can soon turn out to be a valuable project and source of information for the scientific world! If one intends to refine it further, picking up a specific local rare plant or animal species and

photographing every aspect of its life cycle can be of great value for preservation of its environment and food base, hence halting its march towards extinction. We can also join hands as citizen conservationists, with other conservation scientists, offering our photographic skills to create a stronger impact of any project in their hands, bringing the much needed public visibility to their dedicated efforts.

Those who decide to indulge in this field, automatically get elevated to the next level, as their passionate, albeit self-indulgent, hobby turns into a tool to sensitize the people about the fragility of our ecosystem, hence bringing about a positive change for the community. The future generations will surely be indebted towards the sincere contributions of conservation photographers in saving our planet Earth.

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Dr. Dushyant Singh Gaur is a Life Member of WPS. He is a keen Nature and Wildlife Photographer, awarded twice by Uttarakhand Government. He is an active conservationist involved in educating young students, regarding threats to the biosphere and its delicate ecosystem. Professionally, he is Professor & Head of Laboratory Services at Himalayan Institute of Medical Sciences, Jolly Grant, Dehradun, India.

Lesser Florican (*Sypheotides Indica*)

Kr. Yashwant Bhinai

Nestled in the Aravalli hills, 59 kms from Ajmer is the proud fort of Bhinai built by my ancestors. The Bhinaigarh has a recorded history of 400 years and the Fort itself is much older. This is my private haven where I find peace and solitude, far from the hustle and bustle of city life. It has also been my first open classroom where I developed a love for mother nature and an interest towards the flora and fauna of the area. As a child, I have grown up observing Neelgai, Chinkara and Blackbuck, feeding peacefully on my farms. Unfortunately, with the growth in human population and development, much has changed. Today one can only find Neelgai while the other two species of antelopes have vanished from the area.

But what I look forwards to is the monsoons. A season when the scanty rainfall in the area converts the dry desert habitat into a sea of green. This is also the time when I eagerly wait for the arrival of a special guest. **The Lesser Florican.**

Also known as Leekh, Chota Charat, Kharmore or Charaz, this bird belongs to the bustard family

The female has longer neck and pale yellow legs which makes it look bigger in size than the male. The female is sandy buff, mottled, streaked with black. The male in non breeding plumage looks similar to the female except for the upward curled head plumes. These elongated head feathers extend backwards. These soft delicate feathers were much sought after as decorations for "Sar-pech" (a gem studded piece of jewellery) which was part of the Saafa (turban) worn by the nobles.

The bird, prefer open grasslands and agricultural fields. Their diet consists of green shoots, seeds, grains, insects, beetles, locusts, small lizards, caterpillars and frogs.

During the breeding season the male displays a spectacular jumping show as shown in the photos. Constantly jumping and springing up above the cover of long grass or crop to show off his presence to the females and to challenge other males. It does so continuously while making a sound which is difficult to describe. I have personally seen them jumping continuously for 10 min. taking a short break (about 5 min.) and starting all over again in a similar manner. They tirelessly jump throughout the day after sunrise to sunset taking breaks after every jumping session. The frequency of the jumping also depends and varies with the rain and weather. The jumping slows down while they feed in the fields. They mainly feed in the morning and evening.

They are territorial and usually come to the same fields for breeding every year. Their arrival also depends on the advancing monsoons with which they come for breeding from the South.

Eggs are laid on the ground in the fields and the females incubate and take care of the chicks. They are fast flyers and give a duck like appearance from a distance in flight.

Since the birds are vulnerable to poachers during the mating season (August), I deploy my staff to take special care of their breeding areas and prevent locals from disturbing the birds. This has shown good results and over the years I have observed an increase in number of birds visiting my farm.





Great-barbet



Blue-throated barbet



brown_headed_barbet

Barbets

Abhai Mishra

Asian Barbets are tropical birds under the family Megalaimidae and order Piciformes (woodpeckers and relatives). African barbets, American barbets and Toucan barbets belong to their own separate family. There are 26 species of Asian barbet of which 5 occur mainly in the Indian sub-continent. The name “Barbet” is derived from the bristles and feathers found around the base of the bill. They are strong built birds with large heads. Their size varies from 9 to 34 cm. They have sharp tipped, conical and stout bill. Though their legs are comparatively small but are well suited to cling on the trees just like woodpeckers. Most of them are brightly coloured with brilliant plumage including colours like green, blue, red and yellow. The barbets found in India are generally not dimorphic and both the sexes look alike. Their movement is governed by availability of food and not by seasonal migration.

They feed mainly on fruits, berries but some species feed on insects. During breeding season they may switch from being frugivorous to insectivorous. While eating berries they are generally very wasteful aiding in seed dispersal. As their bills are quite strong they are able to excavate holes in the trees for themselves for nesting. Often they use the same nest hole for successive breeding. They lay 2-5 eggs and the incubation period is from 12-15 days with rearing done by both the parents. They have a loud call and jerk their heads or tail during calling. The powerful call can be heard from a long distance. Their presence normally signifies rich bird life in the area.

Normally they are found at the top of a tree and are difficult to spot despite their bright plumage as they readily get mixed with the tree foliage. They have the ability to sit at a single place for a long time without any significant movement. During the breeding season they are very active and can call persistently for longer durations, otherwise they are relatively quiet. Barbets found in India are Great barbet, Brown-headed barbet, White-cheeked barbet, Lineated barbet, Golden-throated barbet, Blue-throated barbet, Blue-eared barbet, Malabar barbet and Coppersmith barbet.

About the Author:

तेन्दुआ शावकों को ग्रामीणों से छुड़ाकर माँ तक पहुँचाने का अदभुत अनुभव

• मन्सूर मज़हर मुरादाबाद

25 मई 2017 की सुबह मैं अपने ऑफिस में अपने स्टाफ को उसी दिन देने वाले जरूरी और बहुत अर्जेंट ऑर्डर्स के बारे में समझा ही रहा था कि वाईल्ड लाईफ प्रिज़र्वेशन सोसायटी के मैम्बर और वन्य जन्तु संरक्षण में मेरे साथी संभल ज़िले के श्री सैम्युल सिंह जी का फोन आया की मन्सूर भाई वन विभाग से कॉल आयी है कि मुरादाबाद जनपद के ठाकुरद्वारा में कुछ ग्रामीणों ने लेपर्ड (तेन्दुआ) के तीन शावकों को गन्ने के खेत से उठा लिया है और यदि तुरन्त वहाँ पहुँचकर तेन्दुए के शावकों को अपने कब्जे में नहीं लिया तो शावकों की जान को खतरा हो सकता है।

क्योंकि यह मामला वन्य जीवों के प्रति मेरी रूचि और वन्य जीव संरक्षण का था लिहाज़ा मुझे बहुत जरूरी कारोबारी काम होने के बावजूद भी मैंने वहाँ जाकर तेन्दुए के बच्चों की जान बचाने के लिए तुरन्त ही हाँ कर दी और बगैर समय गवाये मैं और सैम्युल सिंह ठाकुरद्वारा के लिए रवाना हो गये। वहाँ जाकर मालूम हुआ कि ठाकुरद्वारा के मुनीमपुर में भानूप्रताप के खेत में सुबह सवेरे काम करने के दौरान मज़दूरों ने एक मादा तेन्दुआ और उसके तीन शावकों को देखा, शावकों की आयु लगभग 15 दिन थी वहाँ काम करने वाले ग्रामीणों का शोर सुनकर और लोग भी इकट्ठा हो गये और उन्होंने लाठी डण्डों से डरा धमकाकर तेन्दुआ माँ को खदेड़ दिया और उसके तीनों बच्चों को उठा लिया है। ग्रामीण आक्रोश में लेपर्ड और उस के बच्चों को मारना चाहते थे क्योंकि इस क्षेत्र में तेन्दुए का खेतों में घूमना और लोगो पर हमला करने की घटनायें घटती रहती है, जिसके कारण लोगो के दिल में तेन्दुए के लिए आक्रोश रहता है। वहाँ जाकर मैंने और सिंह साहब ने वन विभाग के साथ मिलकर किसी तरह ग्रामीणों के चंगुल से तीनों शावकों को छुड़ाकर अपने कब्जे में ले लिया और पुलिस की सहायता से इकट्ठा भीड़ को वहाँ से भगा दिया।

43.C तापमान और तेज़ धूप में शावकों को सुरक्षित रखने और उन की माँ को खोज कर बच्चों को उस तक पहुँचाने की हम पर एक बहुत बड़ी चुनौती थी हमने पहले तो वहाँ मौजूद ग्रामीणों की निशान दही पर मादा तेन्दुए को आसपास के क्षेत्र में काफी तलाश किया परन्तु कोई सफलता नहीं मिली इसी बीच मेरी नज़र खेतों के बीच एक छोटे से बरसाती नालों में तेन्दुए के पगमार्क पर पड़ी जिसे देखकर हमे यकीन हो गया कि माँ अपने बच्चों की खोज में इसी नाले के द्वारा यहाँ आयेगी और यहीं आसपास ही बच्चों को तलाश करेगी।

इसी को ध्यान में रखकर मैंने और सिंह साहब ने शावकों को यहीं रखने का फैसला किया परन्तु शावकों का दूसरे जंगली जानवरों जैसे सियार इत्यादि से खतरे को भी ध्यान में रखना बहुत जरूरी था इसी के मद्देनज़र हमने वहाँ एक इतना गहरा गड्ढा खोदने की योजना बनायी कि जिसमें तेन्दुए के बच्चों को रखने पर वह ऊपर नहीं चढ़ सकें और मादा तेन्दुए को सब कुछ प्राकृतिक सा प्रतीत हो, इसके लिए गड्ढे में घास और पेड़ों की पत्ती डाल दीं। मेरे, सैम्युल सिंह जी और वन क्षेत्राधिकारी श्री जी0एस0पाल जी के काफी विचार विमर्श के पश्चात शावकों को हमारे द्वारा बनाये गये गड्ढे में रखने का समय दिन छुपने के वक्त का निर्धारित किया गया और वहाँ से लगभग 350 मीटर की दूरी पर छुपकर मादा तेन्दुआ की गतिविधि पर नज़र रखने के इरादे से हम लोग बैठ गये और फिर पहली बार रात को नौ बजे हमने वहाँ जाकर देखा तो तीनों शावक जैसे के तैसे गड्ढे में मौजूद थे तथा आस पास भी कोई तेन्दुए के पगमार्क नहीं थे जिस से यह साफ था कि मादा तेन्दुए इन के आस पास भी नहीं आयी है यह देखकर हमे थोड़ी निराशा ज़रूर हुई परन्तु हमने हिम्मत नहीं हारी और तपती गर्मी एवं रात के अन्धेरे में खुले आसमान के नीचे डटे रहे किन्तु हम यह विचार ज़रूर करने लगे थे कि यदि मादा तेन्दुआ लोट कर नहीं आती है तो हमें कुछ समय बाद ही बच्चों को किसी लेपर्ड रेस्क्यू सेन्टर भेजना पड़ेगा क्योंकि ज्यादा समय बीतने पर बच्चों के भूख से मरने का खतरा बना हुआ था। हमने पुनः रात के एक बजे शावकों को वहाँ जाकर देखा तो हमारी खुशी का ढिकाना नहीं था क्योंकि इस बार हमे वहाँ शावक नहीं मिले बल्कि मादा तेन्दुए के पगमार्क मिट्टी में मिले, जिससे यह साफ ज़ाहिर था कि बच्चों को उनकी माँ मिल गयी है और वह उनको वहाँ से कहीं दूर सुरक्षित स्थान पर ले जा चुकी है। इस प्रकार हमारा लेपर्ड कब्स रेस्क्यू ऑपरेशन सफलता के साथ समाप्त हुआ।

